MC-5150-AC/DC User's Manual

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www.moxa.com/product

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MC-5150-AC/DC User's Manual

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1

Introduction

The MC-5150-AC/DC computer is based on the Intel Core™ i5 520E processor and comes with 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, 12 NMEA ports , and offers high performance and versatile peripherals for various industrial applications.

The MC-5150-AC/DC's rugged and fanless design and 1G anti-vibration and 5G anti-shock make it particularly well-suited for bridge systems in marine applications. In addition, the compact size and low power consumption features ensure an easy installation and reliable system operations, and the modular design allows easy integration with the panel.

Users can easily install Windows 7, Windows XP SP3, Windows XP Embedded to provide a flexible and friendly environment for system development and application implementation.

The following topics are covered in this chapter:

- **Overview**
- **Package Checklist**
- **Product Features**
- **Hardware Specifications**
- **Hardware Block Diagram**

Overview

The MC-5150-AC/DC series computer is based on the Intel Core™ i5 520E processor and comes with 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, 12 NMEA ports , and offers high performance and versatile peripherals for marine applications.

Users can easily install Windows 7, Windows XP SP3, Windows XP Embedded to provide a flexible and friendly environment for system development and application implementation.

Package Checklist

The MC-5150-AC/DC Series includes the following model:

MC-5150-AC/DC:
x86 ready-to-run computers with Intel Core™ i5 520E, 4 serial ports, 2 Gigabit Ethernet ports, 6 USB hosts, 12 NMEA ports, storage, VGA/DVI

Each model is shipped with the following items:

- MC-5150-AC/DC embedded computer
- 2 removable storage protection keys
- Terminal block for power input (DC model only)
- 12 terminal blocks for NMEA ports
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

NOTE Please notify your sales representative if any of the above items are missing or damaged.

Product Features

The MC-5150-AC/DC embedded computer has the following features:

- High performance Intel Core™ i5 520E processor, 3 MB L2 cache
- Built-in 2 GB DDR3 memory, supports up to 4 GB
- Dual independent displays (DVI-I + VGA)
- 2 Gigabit Ethernet ports for network redundancy
- 2 RS-232/422/485 serial ports
- 2 RS-232 ports
- 12 NMEA ports
- 6 USB 2.0 hosts
- 1 internal SATA storage slot for SSD
- 1 external storage slot for storage expansion
- 1G anti-vibration and 5G anti-shock design for system reliability
- Fanless design with compact size
- 24 VDC or 110 to 240 VAC power input models available
- Supports Windows XP Embedded, Windows XP SP3, Windows 7

Hardware Specifications

Computer

CPU: Intel® Core™ i5 520E (BGA CPU package), 2.4 GHz processor

OS: Windows 7, Windows XP SP3, Windows XP Embedded (must be installed by the user)

System Chipset: Intel® QM57 Express Chipset

DRAM: 2 GB DDR3 SDRAM onboard

USB: USB 2.0 hosts x 6, Type A connectors

Storage

Storage Support:

• 1 internal SATA storage tray for SSD

• 1 removable SATA storage tray for storage expansion with 60 GB SSD

Other Peripherals

KB/MS: 2 PS/2 interfaces supporting standard PS/2 keyboard and mouse

Audio: line-in/out interface

Display

Graphics Controller: Onboard Intel® HD graphics

Display Interface:

• VGA Interface: 15-pin D-Sub connector (female), with resolution up to 1920 x 1080

• DVI-I Interface: 29-pin DVI-I connector (female)

Ethernet Interface

LAN: 2 auto-sensing 10/100/1000 Mbps ports (RJ45)

Magnetic Isolation Protection: 1.5 KV built in

Serial Interface

Serial Standards:

• 2 RS-232/422/485 ports, software-selectable (DB9 male)

• 2 RS-232 ports (DB9)

• 12 NMEA ports (Phoenix 3.81 mm compatible connector)

Serial Communication Parameters

Data Bits: 5, 6, 7, 8

Stop Bits: 1, 1.5, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 230.4 Kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND

RS-422: TxD+, TxD-, RxD+, RxD-, GND

RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND

RS-485-2w: Data+, Data-, GND

LEDs

System: Storage, Power

LAN: 100M/Link x 2, 1000M/Link x 2 (on connector)

Physical Characteristics

Housing: Aluminum, sheet metal

Weight: 6.85 kg

Dimensions: 287 x 250 x 140 mm (11.30 x 9.84 x 5.51 in)

Mounting: Wall

Environmental Limits

Operating Temperature: -15 to 55°C (5 to 131°F)

Storage Temperature: -20 to 60°C (-4 to 131°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Anti-vibration:

• 0.7 g @ DNV 2.4 (Class A), sine wave, 2-100 Hz, 1 Oct./min., 1.5 hr per axis

• 1 grms @ DNV 2.4, random wave, 3-100 Hz, 2.5 hr per axis

• 2.1 g @ DNV 2.4 (Class C), sine wave, 2-50 Hz, 1 Oct./min., 1.5 hr per axis

Anti-shock: 50 g @ IEC 60068-2-27, half sine wave, 11 ms

Power Requirements

Input Voltage:

• DC Model: 24 VDC (with tolerance from 18 to 30 VDC, 2-pin terminal block)

• AC Model: 100 to 240 VAC

Power Consumption: Less than 100 W, 2.5 A @ 24 VDC

Standards and Certifications

Safety: UL 60950-1, DNV 2.4 (Pending), IEC 60945 (4th) (Pending), IACS-E10 (Pending)

EMC: EN 55022 Class B, EN 55024-4-2, EN 55024-4-3, EN 55024-4-4, FCC Part 15 Subpart B Class B

Marine: IEC 60945 4th. (Pending), IACS-E10 (Pending)

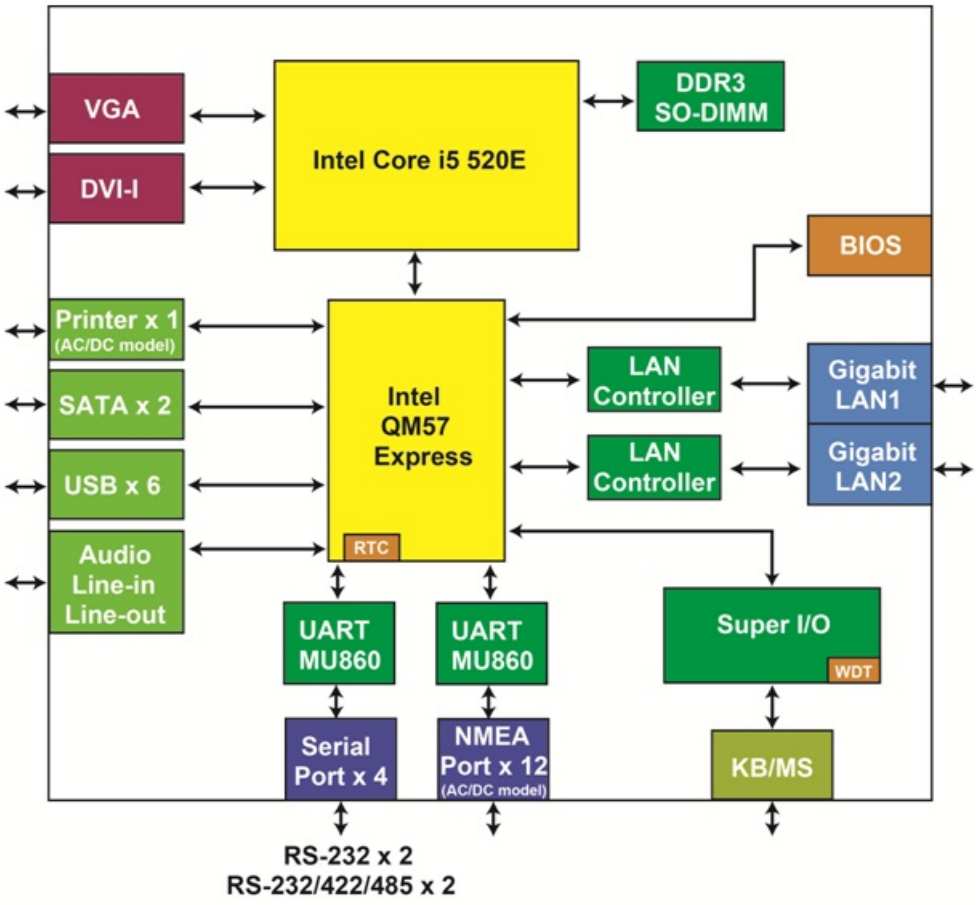
Green Product: RoHS, cRoHS, WEEE

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Hardware Block Diagram



2

Hardware Introduction

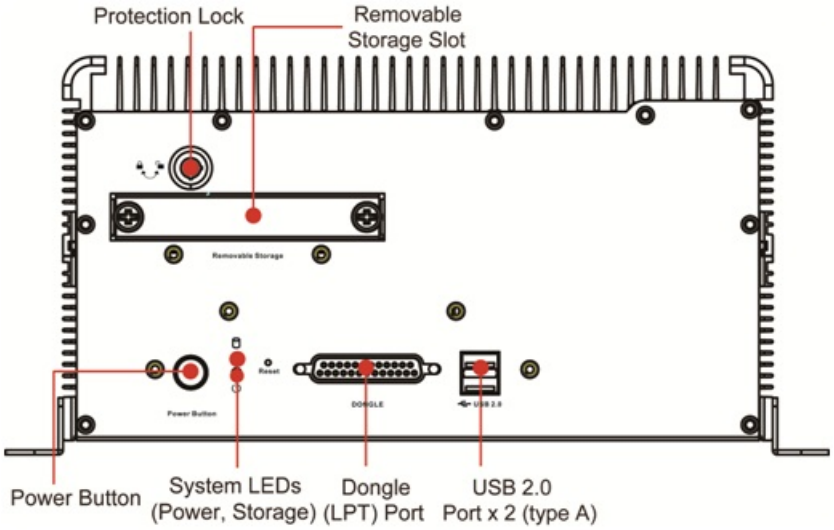
The MC-5150-AC/DC computer is compact, well-designed, and built rugged enough for industrial applications. LED indicators help you monitor performance and identify trouble spots, multiple serial ports allow you to connect different devices for wireless operation, and the reliable and stable hardware platform lets you devote your attention to developing your applications.

The following topics are covered in this chapter:

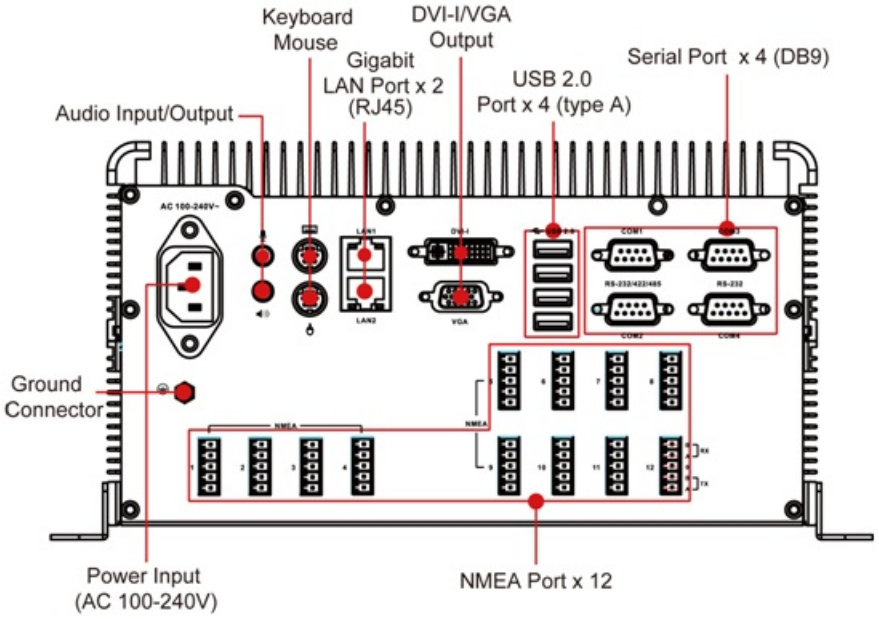
- **Appearance**
  - AC/DC Model Front View
  - AC Model Rear View
  - DC Model Rear View
- **Dimensions**
- **LED Indicators**
- **Real Time Clock**

Appearance

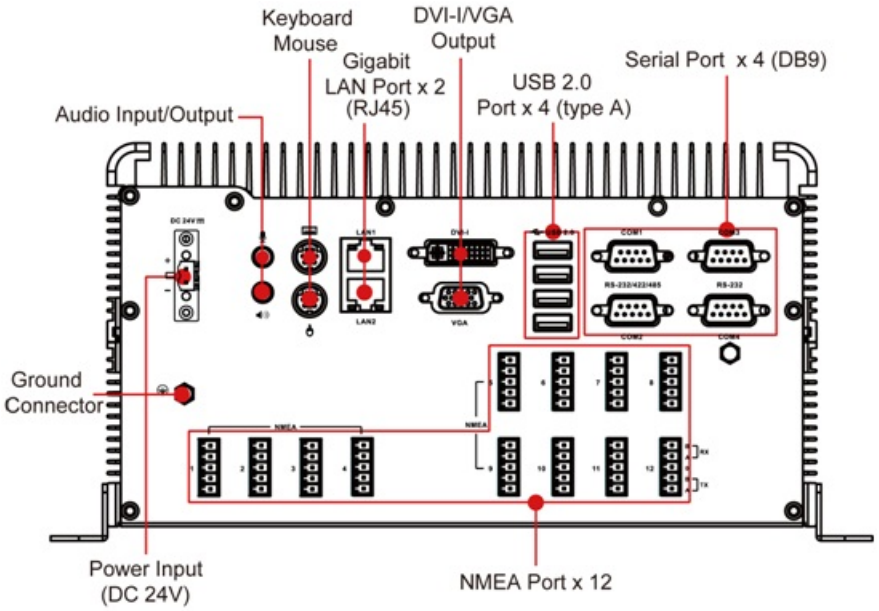
AC/DC Model Front View



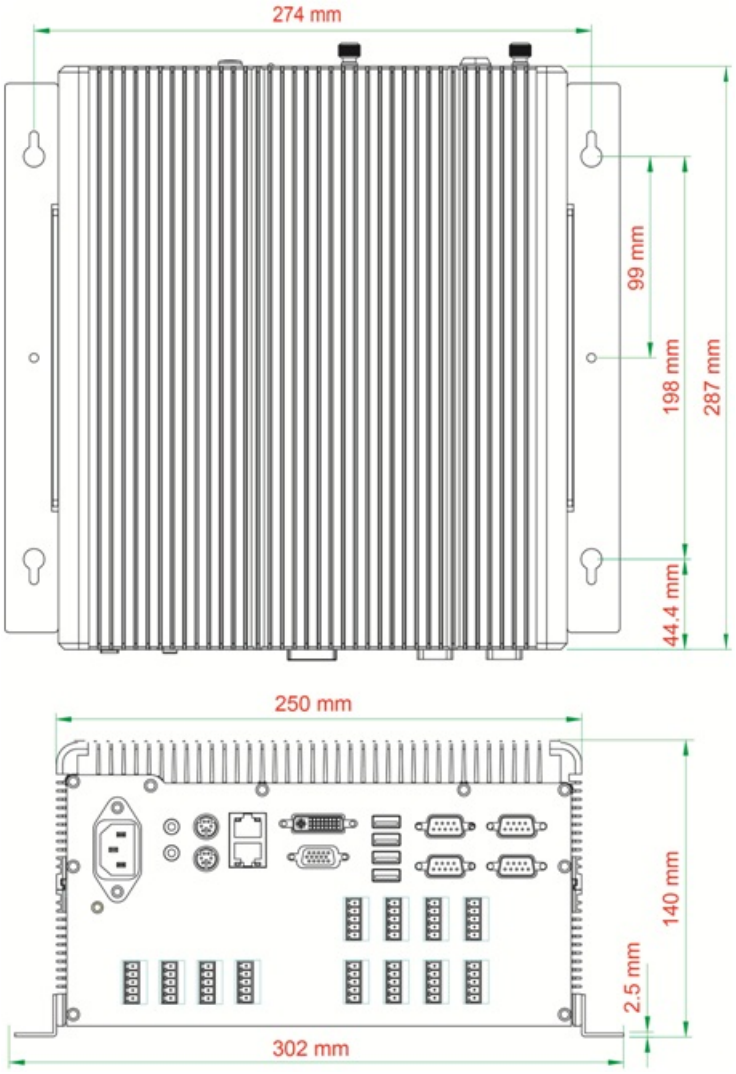
AC Model Rear View



DC Model Rear View



Dimensions



LED Indicators

LED Name	LED Color	LED Function
Power	Green	Power is on and functioning normally
	Off	Power is off or a power error exists
Storage	Red (on)	SSD is inserted and detected
	Red (blinking)	SSD is reading/writing
	Off	No activity
LAN	Green	100 Mbps Ethernet mode
	Yellow	1000 Mbps (Gigabit) Ethernet mode
	Off	No activity or 10 Mbps Ethernet mode

Real Time Clock

The embedded computer's real-time clock is powered by a lithium battery. We strongly recommend that you **NOT** replace the lithium battery on your own. If the battery needs to be changed, contact the Moxa RMA service team at http://www.moxa.com/rma/about_rma.aspx.

ATTENTION

There is a risk of explosion if the wrong type of battery is used. To avoid this potential danger, always be sure to use the correct type of battery. Contact the Moxa RMA service team if you need to replace your battery.

Caution

There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions on the battery.

3

Hardware Connection Description

In this chapter, we show how to connect the embedded computers to the network and to various devices.

The following topics are covered in this chapter:

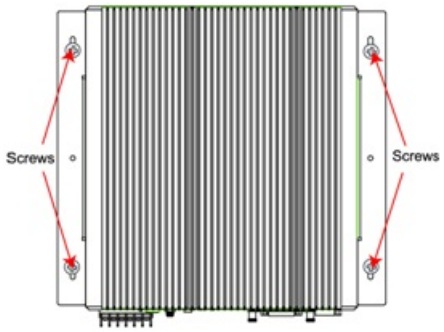
- **Installing the MC-5150-AC/DC**
- **Wiring Requirements**
- **Connecting the Power**
- **Grounding the MC-5150-AC/DC**
- **Connecting Data Transmission Cables**
  - Connecting to the Network
  - Connecting to a Serial Device
- **Connecting a PS/2 Keyboard and Mouse**
- **Connecting to the USB Device**
- **Connecting to a VGA Monitor**
- **Connecting to a DVI-I Monitor**
- **Connecting to a Speaker or a Headphone**
- **Installing the External SATA Hard Disk**
- **Installing the Internal SATA Hard Disk**

Installing the MC-5150-AC/DC

Wall or Cabinet Mounting

The MC-5150-AC/DC has been pre-installed with two brackets on both ends of the computer. Use two screws per side to attach the MC-5150-AC/DC to a wall or cabinet.

Use two screws for each bracket and attach the bracket to the rear of the MC-5150-AC/DC.



Wiring Requirements

This section describes how to connect serial devices to the embedded computer.

You should read and follow these common safety precautions before proceeding with the installation of any electronic device:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

NOTE Do not run signal or communication wiring together with power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- Use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- It is advisable to label the wiring to all devices in the system.

ATTENTION

Safety First!
Be sure to disconnect the power cord before installing and/or wiring your MC-5150-AC/DC.
Wiring Caution!
Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.
If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.
Temperature Caution!
Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

Connecting the Power

The MC-5150-DC model offers 24 VDC power input (with tolerance from 18 to 30 VDC) with the terminal block, and the MC-5150-AC model offers 100 to 240 VAC. If the power is supplied properly, the Power LED will light up.

For safety reasons, please use cables with the following specifications:

Wire range 14-22 AWG, torque 7 lb

Grounding the MC-5150-AC/DC

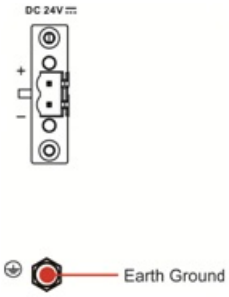
Grounding and write routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting the power.

ATTENTION

This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

EG: See the figure shown below for the location of the Earth Ground on the terminal block power connector. Connect the EG wire to an appropriate grounded metal surface.

DC Model:



AC Model:

Connecting Data Transmission Cables

This section describes how to connect the MC-5150-AC/DC computer to the network and serial devices.

Connecting to the Network

Plug your network cable into the embedded computer's Ethernet port. The other end of the cable should be plugged into your Ethernet network. When the cable is properly connected, the LEDs on the embedded computer's Ethernet port will glow to indicate a valid connection.

The 10/100/1000 Mbps Ethernet LAN port uses 8-pin RJ45 connectors. The following diagram shows the pinouts for these ports.

The LED indicators on the right top and right bottom corners glow a solid green color

when the cable is properly connected to a 100 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

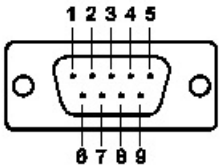
The LED indicators on the left top and left bottom corners glow a solid yellow color when the cable is properly connected to a 1000 Mbps Ethernet network. The LED will flash on and off when Ethernet packets are being transmitted or received.

Pin	10/100 Mbps	1000 Mbps
1	ETx+	TRD(0)+
2	ETx-	TRD(0)-
3	ERx+	TRD(1)+
4	---	TRD(2)+
5	---	TRD(2)-
6	ERx-	TRD(1)-
7	---	TRD(3)+
8	---	TRD(3)-

Connecting to a Serial Device

The serial ports use DB9 connectors. COM1 and COM2 can run with RS-232, RS-422, or RS-485, and COM3 and COM4 run with RS-232. The pin assignments are shown in the following table:

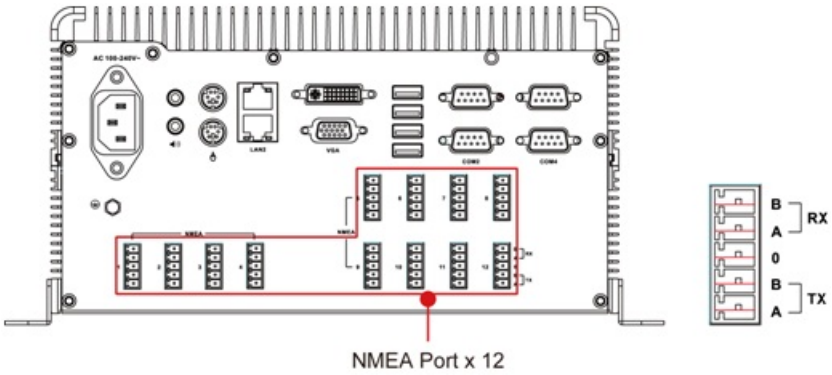
DB9 Male Port



RS-232/422/485 Pinouts

Pin	RS-232	RS-422	RS-485 (4-wire)	RS-485 (2-wire)
1	DCD	TxDA(-)	TxDA(-)	–
2	RxD	TxDB(+)	TxDB(+)	–
3	TxD	RxDB(+)	RxDB(+)	DataB(+)
4	DTR	RxDA(-)	RxDA(-)	DataA(-)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–

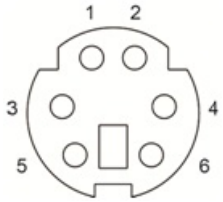
Additionally, 12 NMEA serial ports with Phoenix 3.81 mm compatible connectors are also available on the rear panel of the computer. Refer to the following figures for the location of the NMEA ports and the pin assignments.



Connecting a PS/2 Keyboard and Mouse

Your MC-5150-AC/DC computer comes with 2 PS/2 mini-DIN connectors on the rear panel to connect to a PS/2 keyboard and PS/2 mouse. This 6-pin mini-DIN connector has the pin assignments shown below.

PS/2 Connector



Pin No.	Signal Definition
1	PS/2 Keyboard Data
2	PS/2 Mouse Data
3	GND
4	VCC
5	PS/2 Keyboard Clock
6	PS/2 Mouse Clock

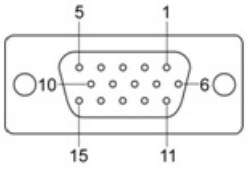
Connecting to the USB Device

The MC-5150-AC/DC comes with 2 USB 2.0 hosts on the front panel, and 4 USB 2.0 hosts on the rear panel. The hosts can be used for an external flash disk or hard drive for storing large amounts of data. You can also use these USB hosts to connect to a keyboard or a mouse.

Connecting to a VGA Monitor

The MC-5150-AC/DC comes with a D-Sub 15-pin female connector on the front panel to connect a VGA CRT monitor. To ensure that the monitor image remains clear, be sure to tighten the monitor cable after connecting it to the MC-5150-AC/DC. The pin assignments of the VGA connector are shown below.

DB15 Female Connector

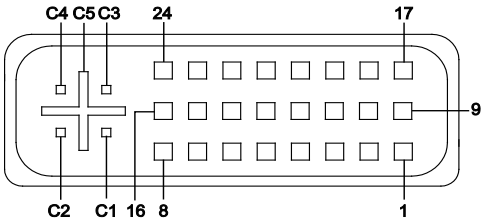


Pin No.	Signal Definition
1	Red
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	VCC
10	GND
11	NC
12	DDC Data
13	HSYNC
14	VSYNC
15	DDC Clock

Connecting to a DVI-I Monitor

The MC-5150-AC/DC computers come with a DVI-I connector that can connect to a DVI monitor. Use the cable to connect one end to the DVI-I connector and the other end to the monitor. See the following table for DVI-I connector pin assignments.

DVI-I Connector



Pin No.	Signal Definition
1	T.M.D.S. Data2-
2	T.M.D.S. Data2+
3	T.M.D.S. Data2/4 Shield
4	N/C
5	N/C
6	DDC Clock
7	DDC Data
8	Analog Vertical Sync
9	T.M.D.S. Data1-
10	T.M.D.S. Data1+
11	T.M.D.S. Data1/3 Shield
12	N/C
13	N/C
14	+5V Power
15	Ground (return for +5V, HSync, and VSync)

Pin No.	Signal Definition
16	Hot Plug Detect
17	T.M.D.S. Data0-
18	T.M.D.S. Data0+
19	T.M.D.S. Data0/5 Shield
20	N/C
21	N/C
22	T.M.D.S. Clock Shield
23	T.M.D.S. Clock+
24	T.M.D.S. Clock-
C1	Analog Red
C2	Analog Green
C3	Analog Blue
C4	Analog Horizontal Sync
C5	Analog Ground (analog R, G, B return)

Connecting to a Speaker or a Headphone

The MC-5150-AC/DC comes with audio input and output interfaces on the rear panel for connecting a microphone and speaker or headphones.

Installing the External SATA Hard Disk

The MC-5150-AC/DC computer comes with a pre-installed SSD drive in the removable slot on the front panel. If you would like to replace the hard disk drive, follow these instructions:

1. Disconnect the MC-5150-AC/DC from the power source.
2. Use the protection key to turn right so that the storage bracket can be taken off by turning the two screws. See the following figure for detailed location.

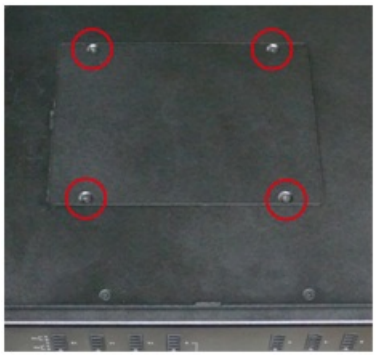
3. Take off the storage bracket from the slot and turn back to remove the four screws.

4. Remove the pre-installed hard disk drive and place the new one on the bracket. Remember to fasten the four screws on the back. When finished, insert the bracket onto the computer, and fasten the two screws. In addition, turn the protection key leftwards to complete the installation.

Installing the Internal SATA Hard Disk

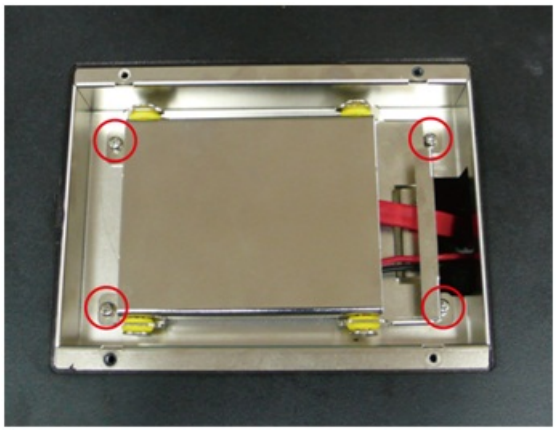
The MC-5150-AC/DC has a SATA connector for installing one SATA hard disks. To install the 2.5-inch SATA hard disk, follow these instructions.

Turn back the MC-5150-AC/DC model, the remove the four screws on the cover plate. See the following figure for detailed location.

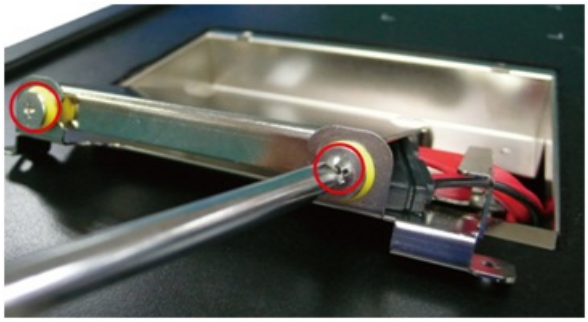


After removing the back plate cover of the computer, you need to install the hard disk installation kit. See the following description.

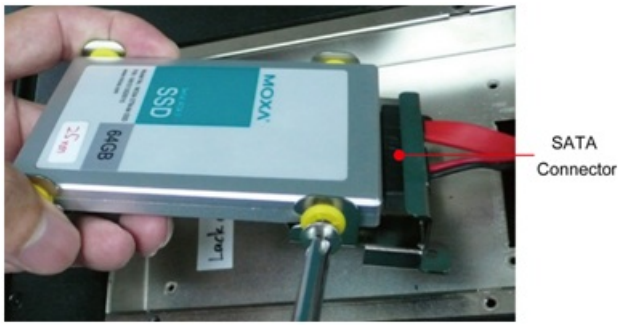
1. Remove four screws on kit.



2. Take off the kit from the computer. However, just leave the connector in the kit. Next, remove the screws on two sides of the hard disk kit and then remove the top cover of the kit.



3. Connect the SATA connector to the disk and then place the hard disk into the kit. Fasten the screws on each side.



4. Place the hard disk kit onto the computer, and fasten the four screws on the kit.

5. Remember to replace the hard disk cover on the computer to complete the installation.

4

BIOS Setup

This chapter describes the BIOS settings of the MC-5150-AC/DC computer. The BIOS is a set of input/output control routines for peripherals. The BIOS is used to initialize basic peripherals and helps boot the operating system before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these basic input/output peripherals. All of the configurations will be stored in the battery backed up CMOS RAM, which retains the system information after system reboots or the power is removed.

The following topics are covered in this chapter:

- **Entering the BIOS Setup Utility**
  - Main Information
- **Modifying the BIOS Main Settings**
  - Advanced Settings
  - Boot Configuration
  - Peripheral Configuration
  - IDE Configuration
  - Thermal Configuration
  - Intelligent Power Sharing
  - Video Configuration
  - USB Configuration
  - Chipset Configuration
  - Hardware Monitor
- **Security Settings**
  - Set Supervisor Password
  - Set User Password
- **Power Settings**
  - Advanced CPU Control
- **Boot Settings**
  - Quick Boot
  - PXE Boot to LAN
  - ACPI Selection
  - USB Boot
  - WDT Timeout
  - Boot Redirection
  - Legacy
- **Exit Settings**
  - Exit Saving Changes
  - Save Change Without Exit
  - Exit Discarding Changes
  - Load Optimal Defaults
  - Load Custom Defaults
  - Save Custom Defaults
  - Discard Changes
- **Upgrading the BIOS**

Entering the BIOS Setup Utility

To enter the BIOS setup utility, press the "F2" key while the system is booting up. The main BIOS Setup screen will appear.

A basic description of each function key is listed at the bottom of the screen. Refer to these descriptions to learn how to scroll about the screen, how to select by pressing "Enter," and how to use the other hot keys listed below.

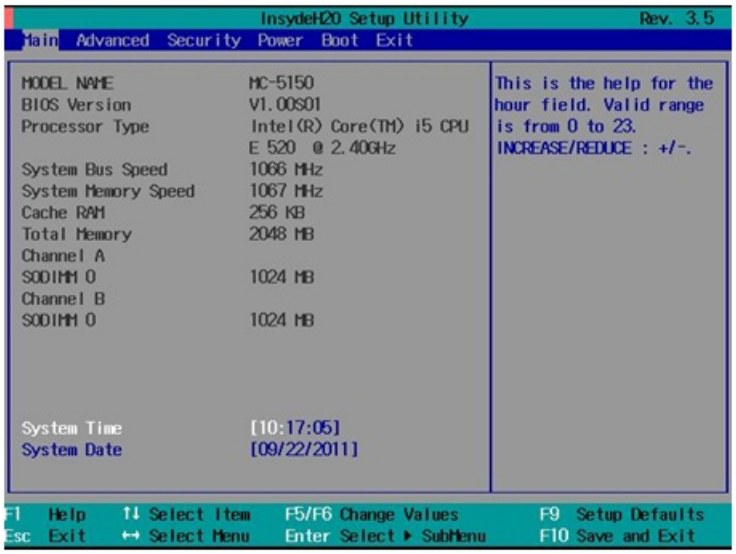
F1: General Help

F5/F6: Change Values

F9: Setup Defaults

F10: Save and Exit

ESC: Exit


InsydeH20 Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
MODEL NAME MC-5150
BIOS Version V1.00S01
Processor Type Intel(R) Core(TM) i5 CPU E 520 @ 2.40GHz
System Bus Speed 1066 MHz
System Memory Speed 1067 MHz
Cache RAM 256 KB
Total Memory 2048 MB
Channel A
SODIMM 0 1024 MB
Channel B
SODIMM 0 1024 MB
System Time [10:17:05]
System Date [09/22/2011]
This is the help for the hour field. Valid range is from 0 to 23. INCREASE/REDUCE : +/-.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

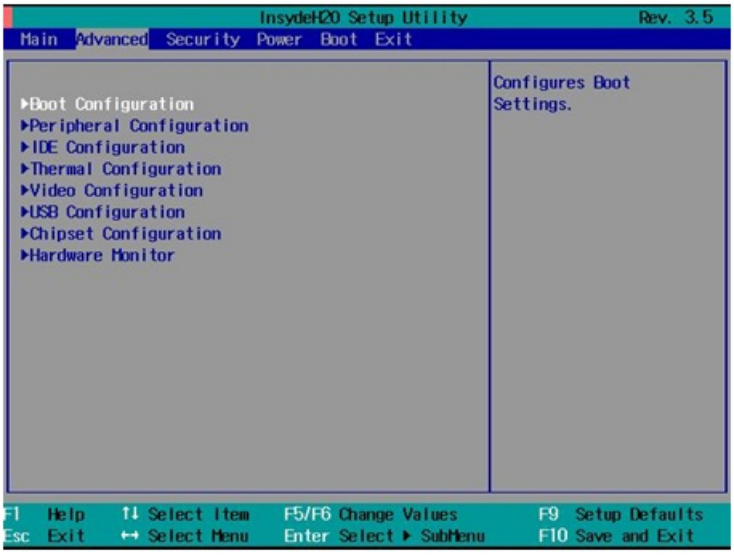
Main Information

The main page indicates the system information, such as model name, BIOS version, and CPU type. User may view the basic system hardware information in the page.

Modifying the BIOS Main Settings

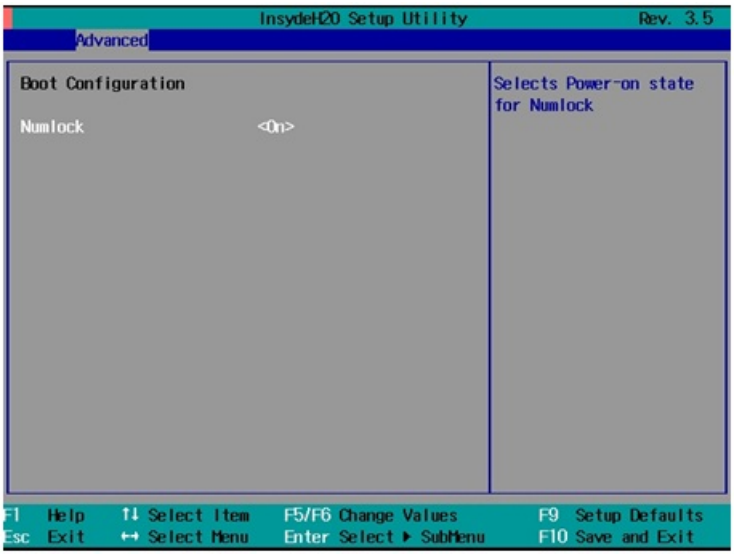
Advanced Settings

The "Advanced Features" screen will appear when choosing the "Advanced" item from the main menu.


InsydeH2O Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
▸Boot Configuration
▸Peripheral Configuration
▸IDE Configuration
▸Thermal Configuration
▸Video Configuration
▸USB Configuration
▸Chipset Configuration
▸Hardware Monitor
Configures Boot Settings.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

Boot Configuration

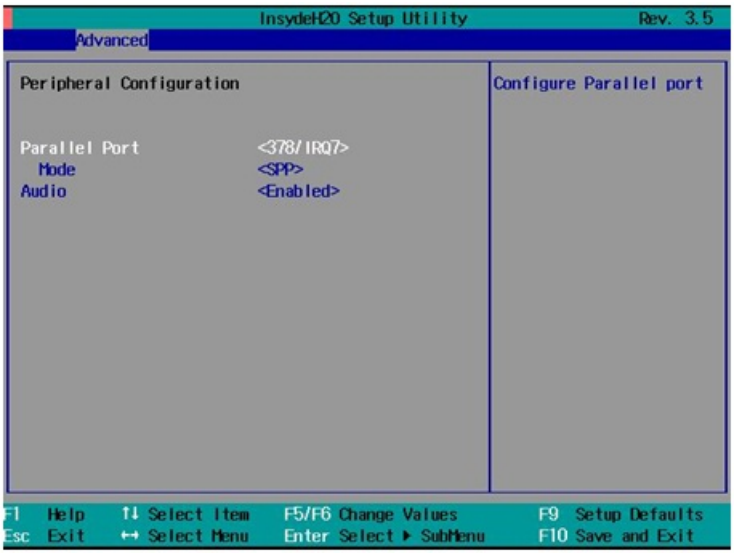
This item allows users to configure the default value of Numlock.


InsydeH2O Setup Utility Rev. 3.5
Advanced
Boot Configuration
Numlock <On>
Selects Power-on state for Numlock
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

Option: On (default), Off.

Peripheral Configuration

This item allows you to configure the parallel port and audio device.


InsydeH20 Setup Utility Rev. 3.5
Advanced
Peripheral Configuration
Configure Parallel port
Parallel Port <378/IRQ7>
Mode <SPP>
Audio <Enabled>
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

Parallel Port

This item allows you to configure the parallel port.

Options: 378/IRQ7 (default), Disabled

Mode

This setting allows you to configure the mode for the parallel port.

Options: SPP (default), EPP, ECP, EPP+ECP

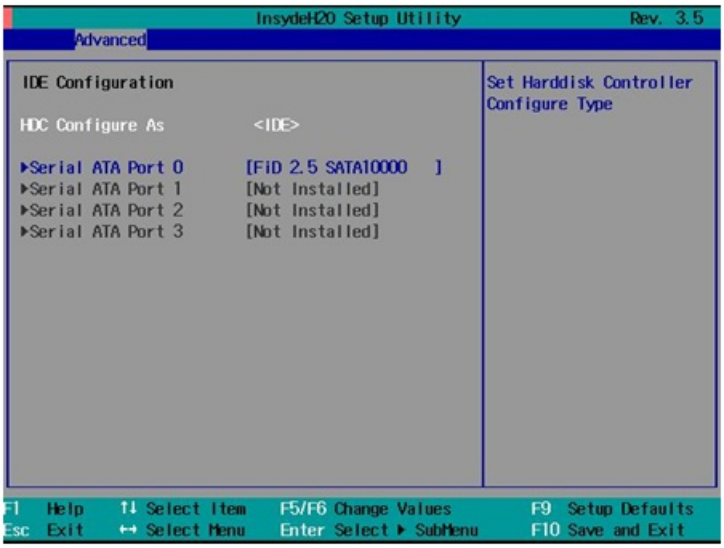
Audio

The item allows you to configure if the system will automatically detect the Audio codec.

Options: Enabled (default), Disable.

IDE Configuration

This item allows you to configure the hard disk controllers.

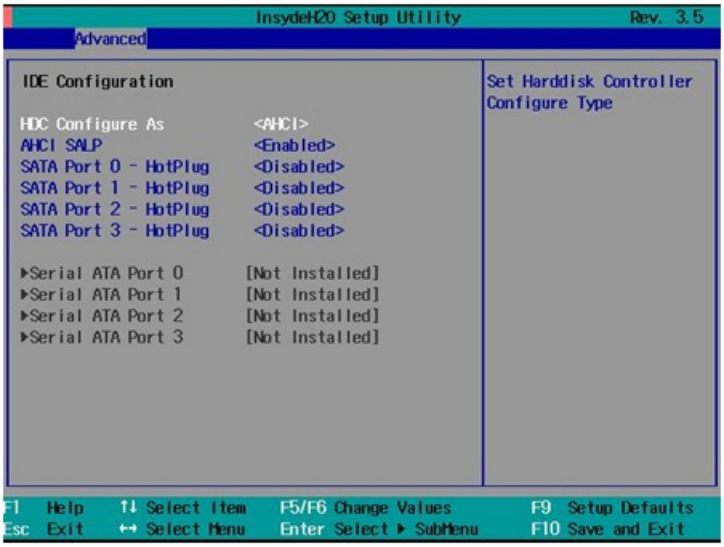

InsydeH20 Setup Utility Rev. 3.5
Advanced
IDE Configuration
Set Harddisk Controller Configure Type
HDC Configure As <IDE>
▸Serial ATA Port 0 [FiD 2.5 SATA10000]
▸Serial ATA Port 1 [Not Installed]
▸Serial ATA Port 2 [Not Installed]
▸Serial ATA Port 3 [Not Installed]
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

HDC Configure As

This item allows you to configure the hard disk type.

Options: IDE (default), AHCI, RAID

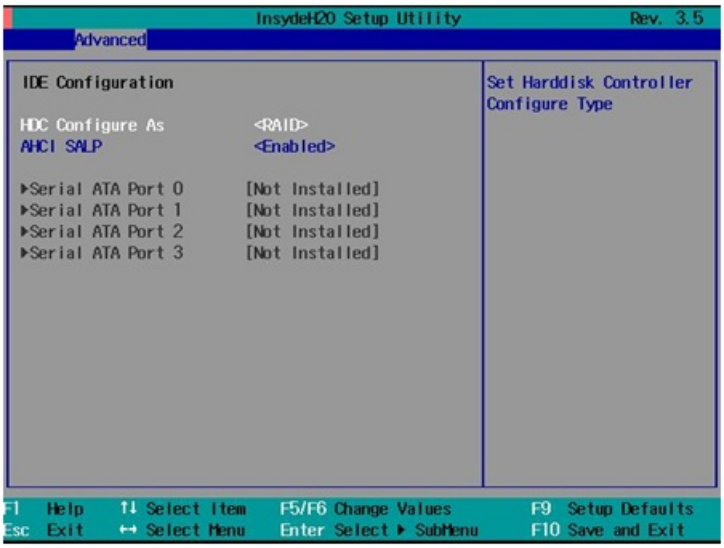
If you select AHCI type, you will see the following information.


InsydeH20 Setup Utility Rev. 3.5
Advanced
IDE Configuration
Set Harddisk Controller Configure Type
HDC Configure As <AHCI>
AHCI SALP <Enabled>
SATA Port 0 - HotPlug <Disabled>
SATA Port 1 - HotPlug <Disabled>
SATA Port 2 - HotPlug <Disabled>
SATA Port 3 - HotPlug <Disabled>
▸Serial ATA Port 0 [Not Installed]
▸Serial ATA Port 1 [Not Installed]
▸Serial ATA Port 2 [Not Installed]
▸Serial ATA Port 3 [Not Installed]
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

This item allows you to configure the hard disk type as AHCI.

Options: Enabled (default), Disabled

If you select RAID, you need to install at least two hard disks to enable the RAID function.


InsydeH20 Setup Utility Rev. 3.5
Advanced
IDE Configuration
Set Harddisk Controller Configure Type
HDC Configure As <RAID>
AHCI SALP <Enabled>
▸Serial ATA Port 0 [Not Installed]
▸Serial ATA Port 1 [Not Installed]
▸Serial ATA Port 2 [Not Installed]
▸Serial ATA Port 3 [Not Installed]
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

Serial ATA Port 0 to 3

This setting allows you to configure the type of the hard disk installed in the computer. Select the hard disk in the list, and enter.

Options: Auto (default), User Defined

AHCI SALP

This item allows you to configure the Support Aggressive Link Power Management (SALP) in AHCI Host Capability Register bit 26.

Options: Enabled (default), Disabled

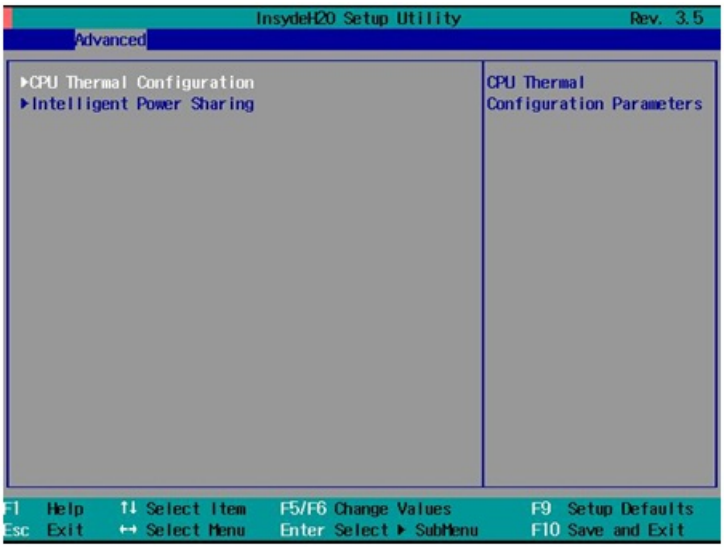
SATA Port 0 to 3 - HotPlug

This item allows you to configure if you would like to enable/disable the hot & plug function of the storage installed on the SATA port 0 to port 3.

Options: Disable (default), Enabled

Thermal Configuration

This item allows you to configure the thermal settings and intelligent power sharing function.


InsydeH20 Setup Utility Rev. 3.5
Advanced
▸CPU Thermal Configuration
▸Intelligent Power Sharing
CPU Thermal
Configuration Parameters
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

DTS

This item allows you to configure the Digital Thermal Sensor (DTS) function.

Options: Critical Reporting (default), Disabled, Enabled

Thermal Mode

This setting allows you to configure the thermal mode.

Options: TM1 and TM2 (default), Disabled, TM1, TM2

ACPI 3.0 T-States

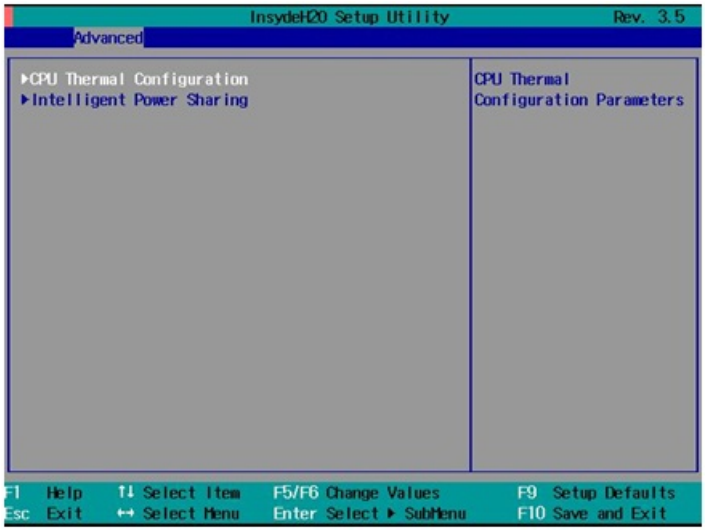
This item allows you to configure the ACPI 3.0 T-States.

Options: Disabled (default), Enabled

Intelligent Power Sharing

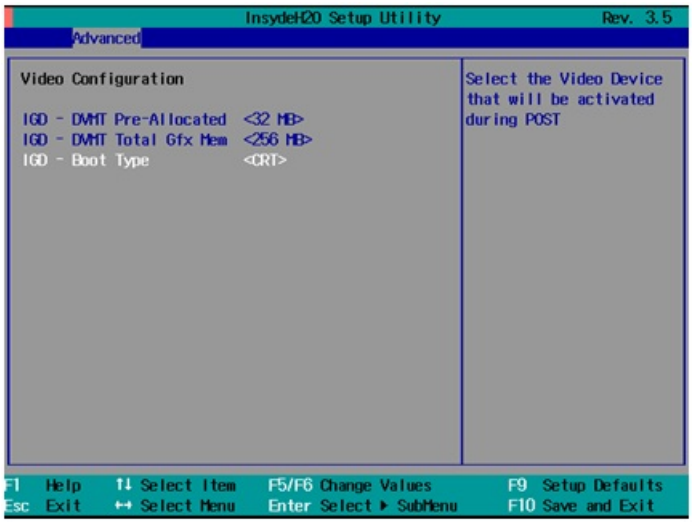
This item allows you to configure the Intelligent Power Sharing (IPS) function.

Options: Disabled (default), Enabled


InsydeH20 Setup Utility Rev. 3.5
Advanced
▸CPU Thermal Configuration
▸Intelligent Power Sharing
CPU Thermal
Configuration Parameters
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

Video Configuration

This item allows you to configure the video settings.


InsydeH20 Setup Utility Rev. 3.5
Advanced
Video Configuration
IGD - DVMT Pre-Allocated <32 MB>
IGD - DVMT Total Gfx Mem <256 MB>
IGD - Boot Type <CRT>
Select the Video Device that will be activated during POST
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

IGD—DVMT Pre-Allocated

This item allows you to configure the DVMT pre-allocated capacity for the graphic memory capacity.

Options: 32 MB (default), 64 MB, 96 MB, 128 MB, 160 MB, 224 MB, 257 MB, 352 MB

IGD—DVMT Total Gfx Mem

This item allows you to configure the capacity of the DVMT 5.0 used by the internal graphics device.

Options: 256 MB (default), 128 MB, 512 MB, 1024 MB

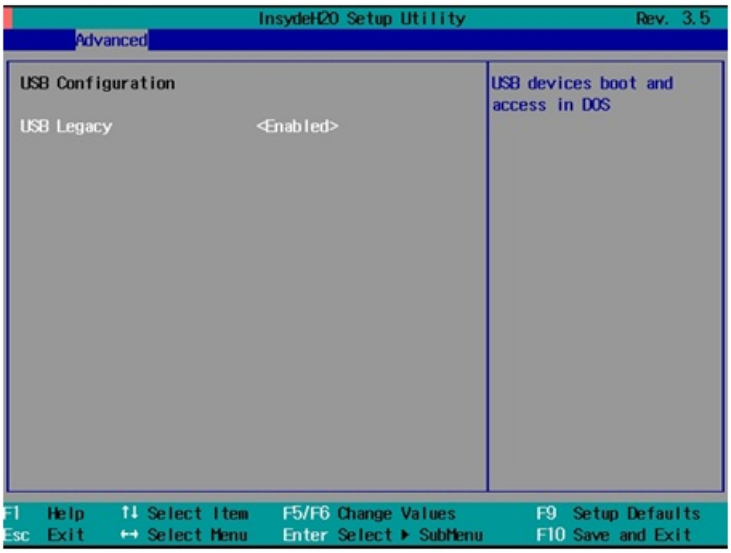
IGD – Boot Type

This item allows you to select the video device which will be activated during POST.

Options: VBIOS Default (default), CRT, DVI-D, DVI-A

USB Configuration

This item allows you to configure the USB setting.


InsydeH20 Setup Utility Rev. 3.5
Advanced
USB Configuration
USB Legacy <Enabled>
USB devices boot and access in DOS
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

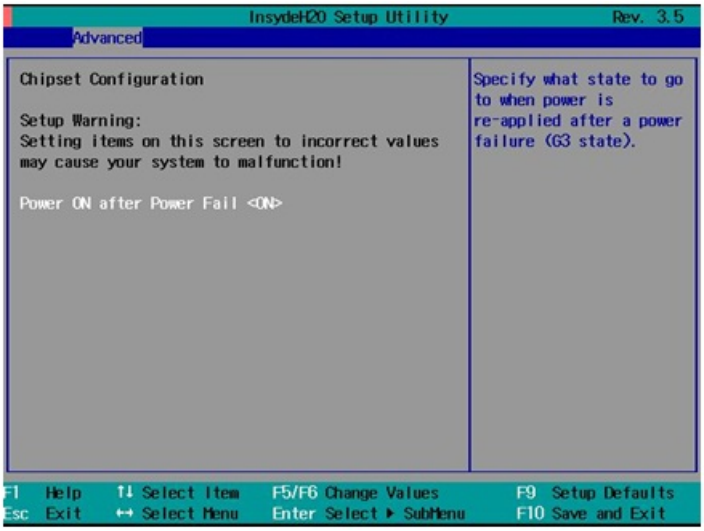
USB Legacy

This item allows you to configure the USB devices that can be accessed during booting and in DOS.

Options: Enabled (default), Disabled

Chipset Configuration

This item allows you to configure the chipset settings.


InsydeH20 Setup Utility Rev. 3.5
Advanced
Chipset Configuration
Setup Warning:
Setting items on this screen to incorrect values may cause your system to malfunction!
Power ON after Power Fail <ON>
Specify what state to go to when power is re-applied after a power failure (G3 state).
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

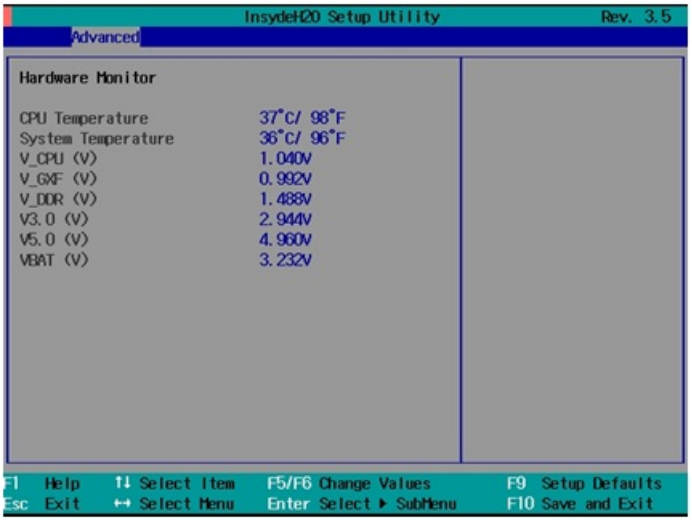
Power ON after Power Fail

This item allows you to enable/disable the power-on-after-power-fail function.

Options: ON (default), OFF, Last State

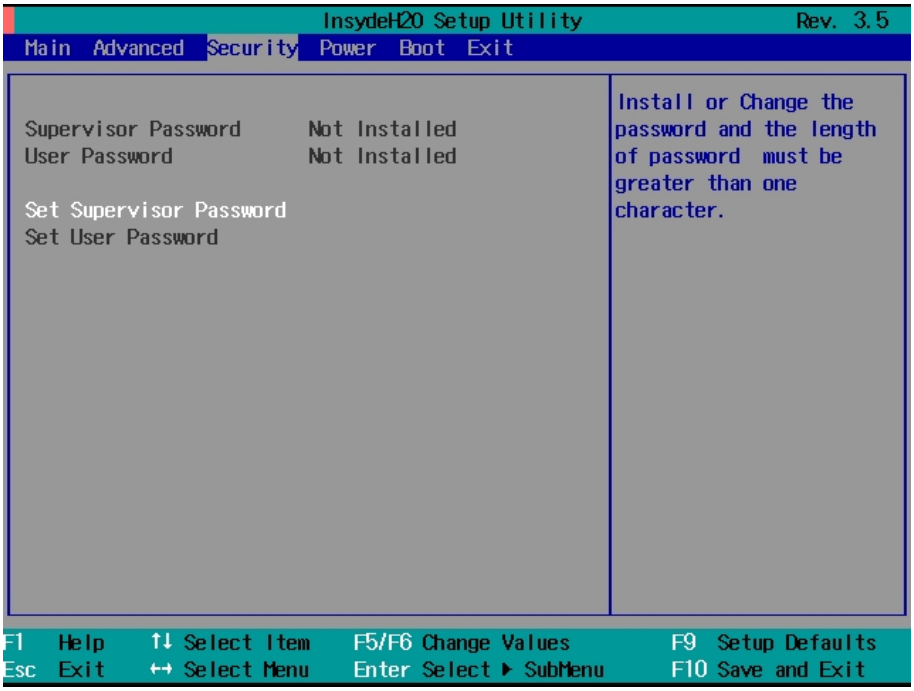
Hardware Monitor

This item allows you to view the status of the hardware utility. You may check various parameters for the hardware status, such as CPU temperature, system temperature, and CPU voltage.


InsydeH20 Setup Utility Rev. 3.5
Advanced
Hardware Monitor
CPU Temperature 37°C/ 98°F
System Temperature 36°C/ 96°F
V_CPU (V) 1.040V
V_GXF (V) 0.992V
V_DDR (V) 1.488V
V3.0 (V) 2.944V
V5.0 (V) 4.960V
VBAT (V) 3.232V
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

Security Settings

The section allows users to configure security settings with supervisor password and user password.


InsydeH20 Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
Supervisor Password Not Installed
User Password Not Installed
Set Supervisor Password
Set User Password
Install or Change the password and the length of password must be greater than one character.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit

Set Supervisor Password

This item allows you set the supervisor password. Select and then enter the password, and then confirm the password again.

To cancel the password, enter Set Supervisor Password item, and then enter the old password, then leave the new password fields blank, and then press enter.

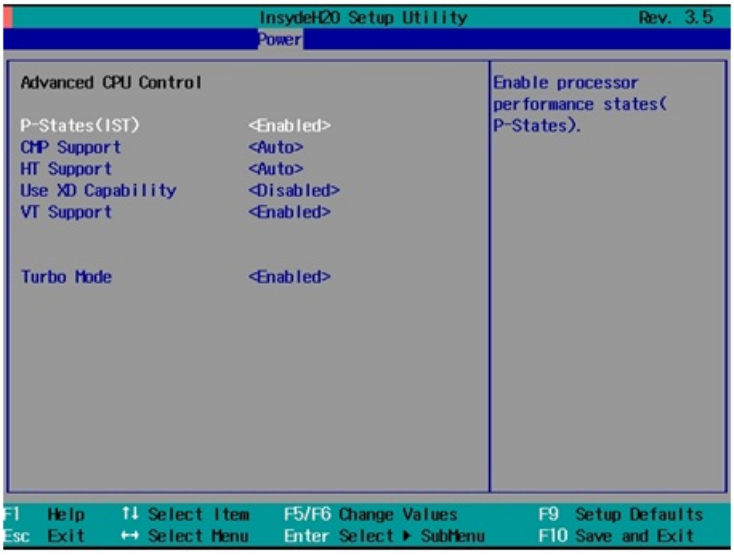
Set User Password

This item allows you set the supervisor password. Select and then enter the password, and then confirm the password again.

Please note that you must set the supervisor password first, so that you can set the user password.

Power Settings

The section allows users to configure power settings.



Advanced CPU Control

P-States (IST)

This item allows you to enable/disable Processor Performance States (P-States) function.

Options: Disabled (default), Enabled

CMP Support

This item allows you to configure the Core™ Multi-Processing (CMP) function.

Options: Auto (default), Disabled

HT Support

This item allows you to configure the Hyper-Threading (HT) function.

Options: Auto (default), Disabled

Use XD Capability

This item allows you to disable/enable processor XD capability function.

Options: Disable (default), Enabled

VT Support

This item allows you to enable/disable the Vanderpool Technology function.

Options: Enabled (default), Disabled

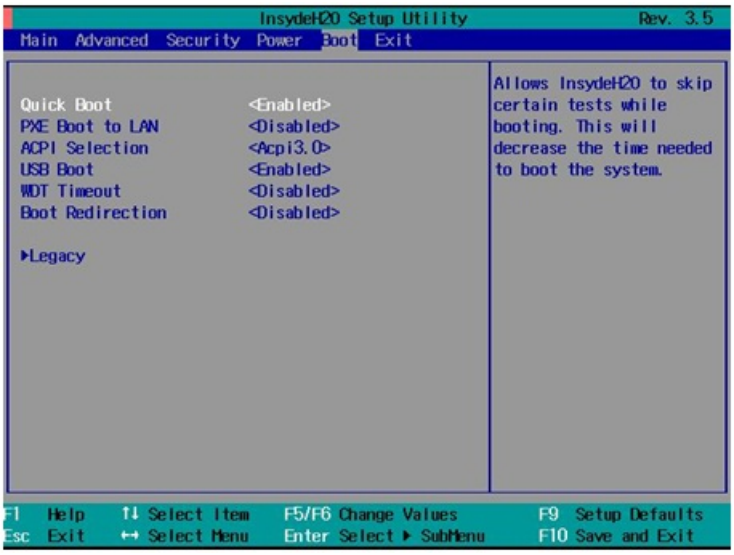
Turbo Mode

This item allows you to configure the processor Turbo Mode function.

Options: Enable (default), Disabled

Boot Settings

The section allows users to configure boot settings.



Quick Boot

This item allows you to enable/disable quick boot function.

Options: Enabled (default), Disabled

PXE Boot to LAN

This item allows you to enable/disable PXE boot to LAN function.

Options: Disabled (default), Enabled

ACPI Selection

This item allows you to select the ACPI version..

Options: Acpi3.0 (default), Acpi1.0B, Acpi4.0

USB Boot

This item allows you to enable/disable USB boot function..

Options: Enabled (default), Disabled

WDT Timeout

This item allows you to set up WDT (Watchdog Timer) timeout after OS boots up.

Options: Disabled (default), 1 minute, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 6 minutes, 7 minutes, 8 minutes, 9 minutes, 10 minutes

Boot Redirection

This item allows you to set up boot to selected device when WDT timeout event trigger, it can co-work with recovery tools to build smart recovery function.

Options: Disabled (default), SATA Port0 HD, SATA Port1 HD, SATA Port2 HD, SATA Port3 HD, USB, LAN (when use LAN, PXE Boot to LAN must set to Enable).

Legacy

Normal Boot Menu

This item allows you to configure the boot menu.

Options: Normal (default), Advance

Boot Type Order

This item allows you to select the boot order. Use F5/F6 to change values.

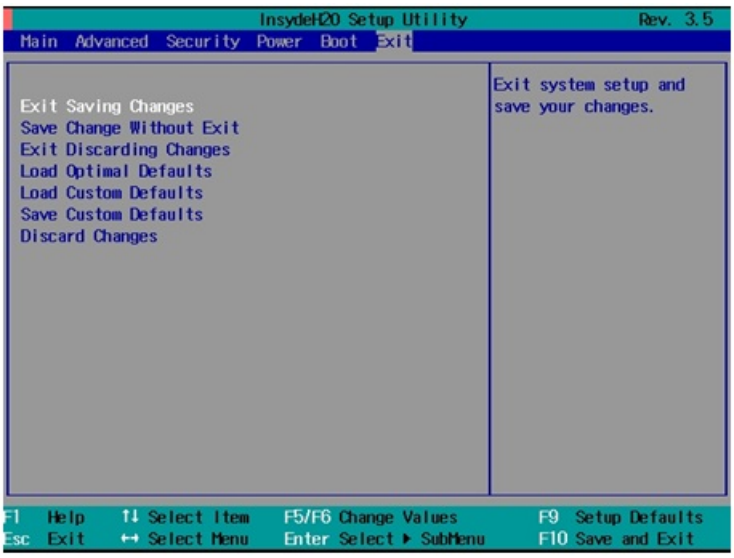
Options: Hard Disk Drive (default), CD/DVD-ROM Drive, USB, LAN

Hard Disk Drive

This item allows you to view the hard disk drive installed in the computer.

Exit Settings

The section allows users to configure exit settings.


InsydeH2O Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
Exit Saving Changes
Save Change Without Exit
Exit Discarding Changes
Load Optimal Defaults
Load Custom Defaults
Save Custom Defaults
Discard Changes
Exit system setup and save your changes.
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

Exit Saving Changes

This item allows you to exit and save the values you have just configured.

Options: Yes (default), No

Save Change Without Exit

This item allows you to save changes but not to exit the BIOS settings.

Options: Yes (default), No

Exit Discarding Changes

This item allows you to exit and not to change the values you have just configured.

Options: Yes (default), No

Load Optimal Defaults

This item allows you to load default values for the BIOS settings

Options: Yes (default), No

Load Custom Defaults

This item allows you to load custom default values for the BIOS settings

Options: Yes (default), No

Save Custom Defaults

This item allows you to save custom default values for the BIOS settings

Options: Yes (default), No

Discard Changes

This item allows you to discard all settings you have just configured.

Options: Yes (default), No

Upgrading the BIOS

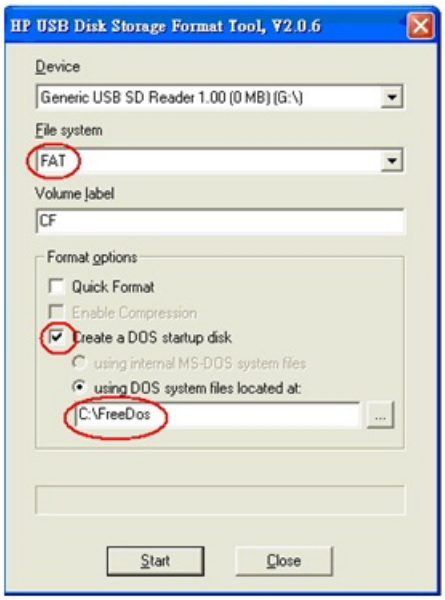
This section describes how to upgrade the BIOS. However, please note that upgrading the BIOS involves high risk of damage to your computer. We strongly recommend that you contact Moxa's TS staff for assistance and obtain all necessary tools and files before attempting to upgrade.

Step 1: Create a Bootable USB Disk

We suggest you use the HP USB Disk Format Tool to create a bootable USB disk. You may download this tool from the Internet. Search the Internet using the phrase "HP USB Disk Storage Format Tool", and then download the tool from one of the listed websites.

You will also need to download the FreeDos system files **kernel.sys** and **command.com** from http://www.freedos.org/kernel/.

1. Copy DOS system files **kernel.sys** and **command.com** to a specified directory (**C:\FreeDOS** in this example).
2. Start the HP USB Disk Storage Format Tool and select the USB device that you want to use as a bootable disk in the **Device** drop down box.
3. Select **FAT** in the **File system** drop down box.
4. Type the disk name in the **Volume label field**.
5. Check the option **Create a DOS startup disk** under format options.
6. Specify the directory of the system files (for example, **C:\FreeDOS**).
7. Click **Start** to format and create the USB disk.



ATTENTION

We suggest you use a USB drive with under 2 GB in disk space, as larger USB drives may not support FAT file format and consequently fail to boot.

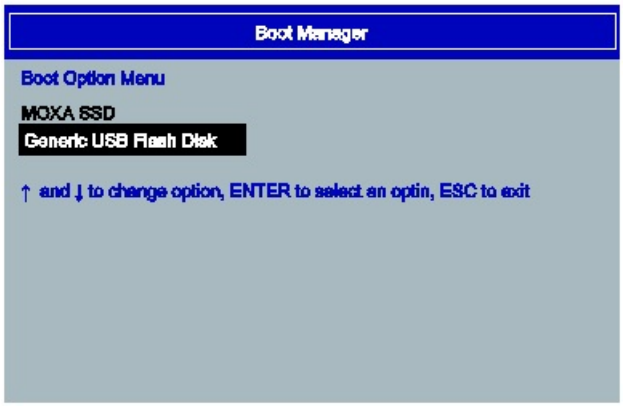
Step 2: Prepare the Upgrade File

You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa's technical department for assistance.

1. Get the BIOS upgrade installation file. The file name should have following format: **MC51xxSxx.exe** (xx refers to version numbers).
2. Copy the file to the Bootable USB Disk.

Step 3: Run the upgrade program on theMC-5150-AC/DC Computer

1. Reboot the computer, press F12 while booting up to go to the Boot Manager
2. Select USB Disk as the first boot source. Press Enter to continue.



3. When boot up finishes, DOS screen will show up. Go to the directory where the upgrade file is located. For example, if the upgrade file is stored in the MC_5150 folder, type cd MC_5150

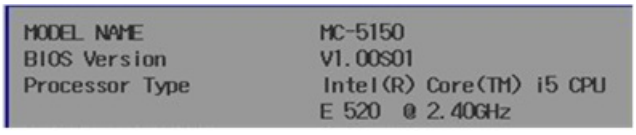
```
C:\cd MC_5150
```

4. Run the upgrade program by typing MC5150S03.exe. Please note that the upgrade filename may vary depending on the versions.

```
C:\ MC_5150>MC5150S03.exe
```

5. The upgrade program will be automatically performed. Please wait until the procedure to be finished.

6. When the upgrade is finished, the computer will automatically reboot. You may check the BIOS version in Main page of the BIOS Setup



ATTENTION

Do NOT switch off the power supply during the BIOS upgrade, since doing so may cause the system to crash.

A

Regulatory Approval Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Class A：FCC Warning! This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

European Community

Warning:

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

B

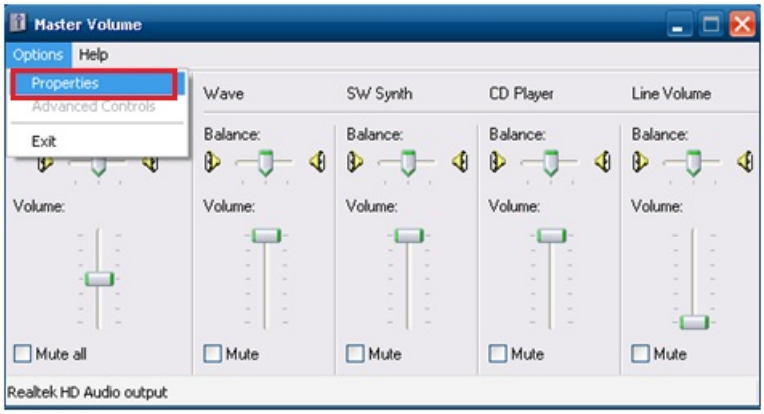
Adjusting the Audio Mixer Function

This chapter describes how to adjust the audio settings for Mixer function of the MC-5150-AC/DC in the Windows XP and Windows XP Embedded operating systems.

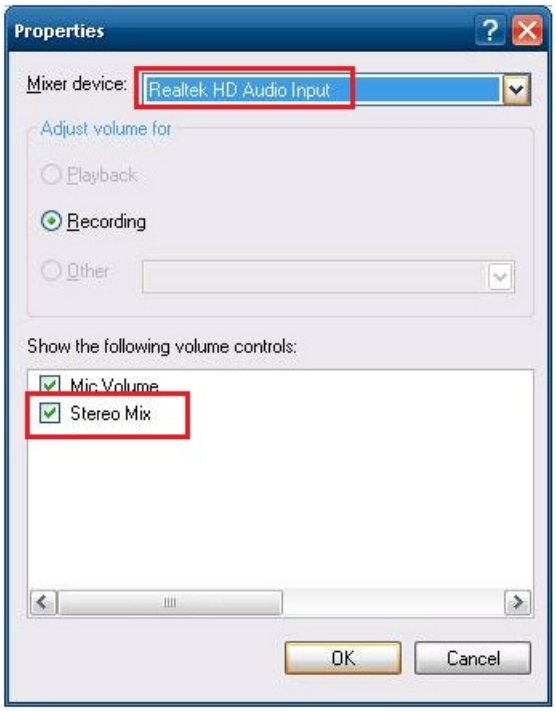
Since the Mixer function is enabled by default, you need modify the default settings of the Realtek audio device so that sounds picked up from the microphone will not be recorded. Follow the steps below:

1. Right-click volume icon and select **Open Volume Control**.

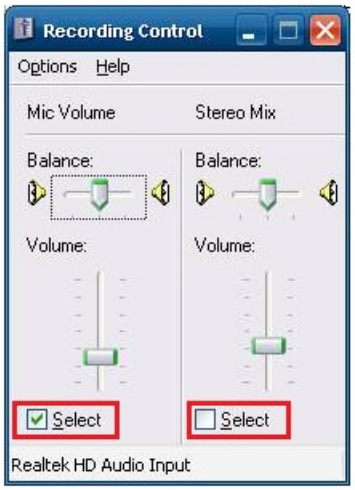
2. Select **Properties**.



3. Select **Realtek HD Audio Input** from the Mixer device drop-down list, and check **Stereo Mix**. Click **OK** to continue.



4. Uncheck the Select checkbox under Stereo Mix and check the Select checkbox under Mix Volume to complete the configuration.

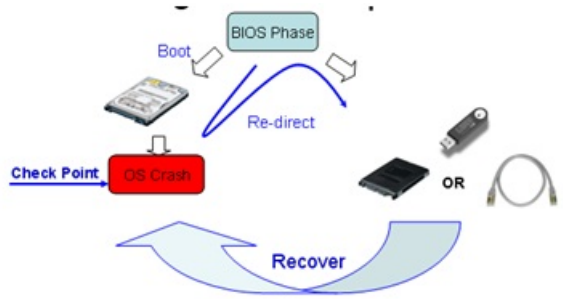


C

Smart Recovery

The MC-5150 provides the Smart Recovery tool that allows users to perform system recovery when the operating system crashes.

File loss and operating system corruption can be a nightmare for computer users. Usually, users find it difficult to fix the problem when the system crashes. Smart Recovery can create a back-up system to restore the operating system automatically. See the following figure for the main architecture of the recovery.

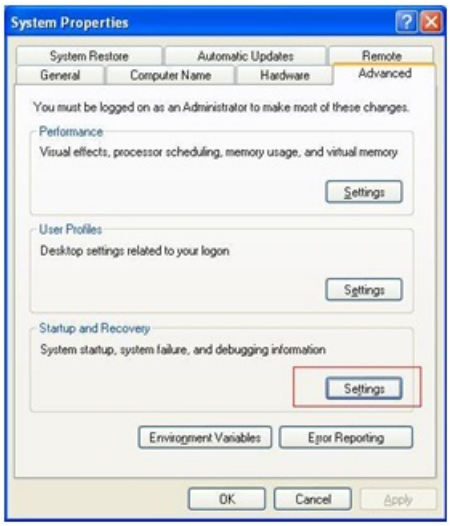


¶To run the Smart Recovery, do the following steps.

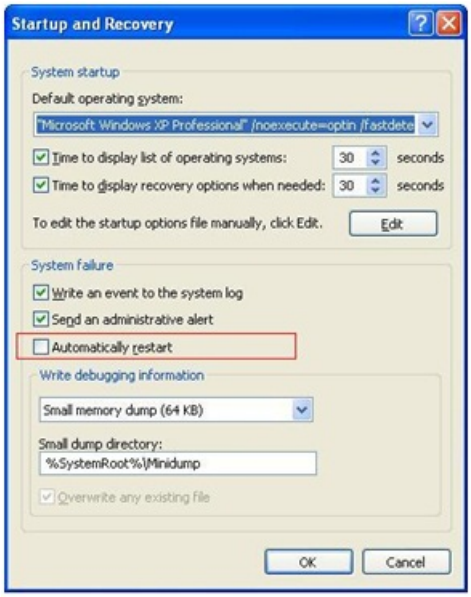
Changing OS Configurations and Enable Check Point Function

To let the OS work properly with smart recovery, you need to modify some configurations.

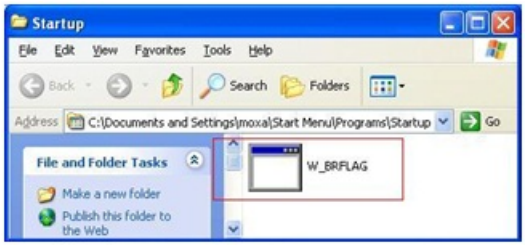
1. Select **Startup and Recovery from My Computer=>System Properties=>Advanced.**



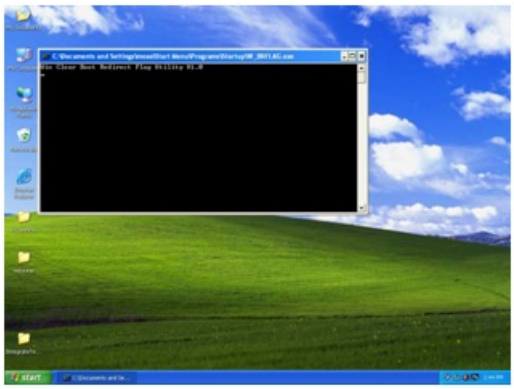
2. Uncheck Automatically **restart**.



3. Copy checkpoint utility **W_BRFLAG** from software CD path: **CD\utility_tools\Smart Recovery** to system startup



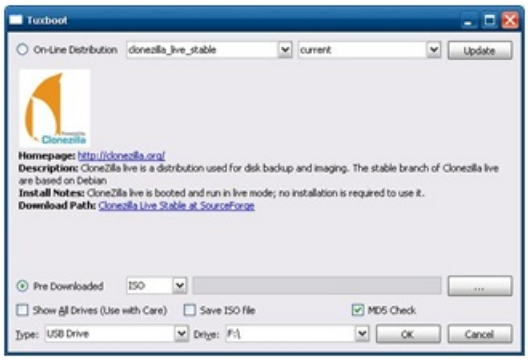
4. The check point function will be enabled each time the system boots up.



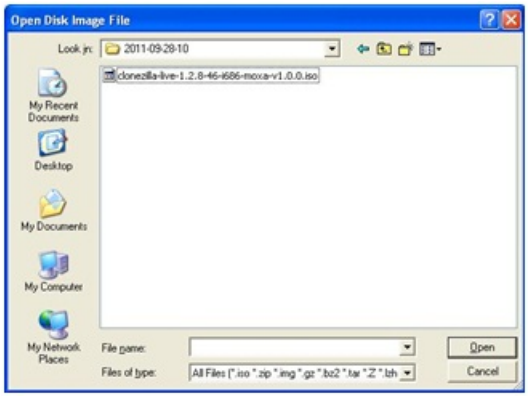
Recovery Procedure

Refer to the following steps for system recovery.

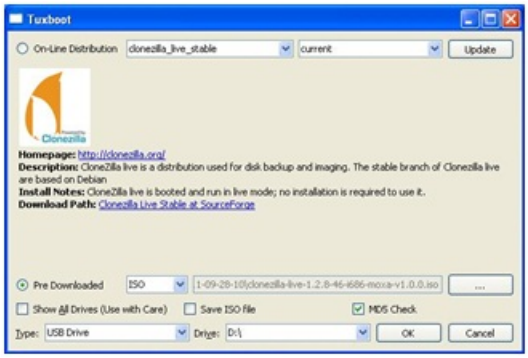
1. Prepare your USB drive
   a. start **tuxboot-windows-23.exe** and click **Pre Download**


Tuxboot
On-Line Distribution
clonezilla_live_stable
current
Update
Clonezilla
Homepage: http://clonezilla.org/
Description: CloneZilla live is a distribution used for disk backup and imaging. The stable branch of Clonezilla live are based on Debian
Install Notes: CloneZilla live is booted and run in live mode; no installation is required to use it.
Download Path: Clonezilla Live Stable at SourceForge
Pre Downloaded
ISO
Show All Drives (Use with Care)
Save ISO file
MD5 Check
Type: USB Drive
Drive: F:\
OK
Cancel

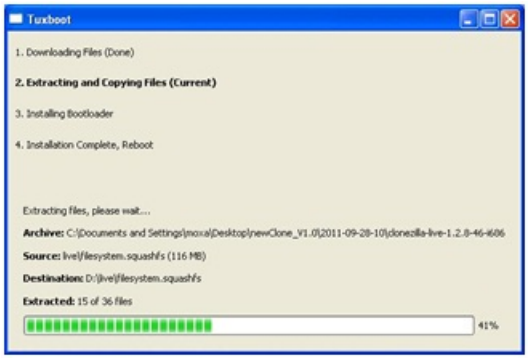
   b. Select ISO file in the directory next to tuxboot-windows-23.exe.



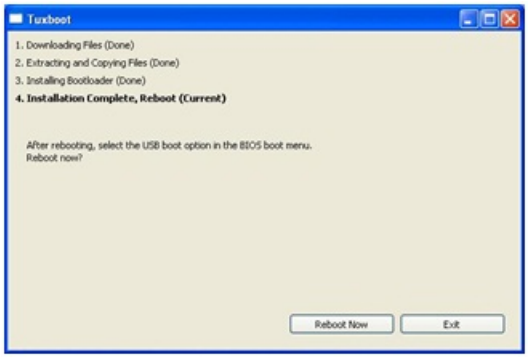
c. Select **USB Drive** type and select **Drive** and then click **OK**.


Tuxboot
On-Line Distribution
clonezilla_live_stable
current
Update
Homepage: http://clonezilla.org/
Description: CloneZilla live is a distribution used for disk backup and imaging. The stable branch of Clonezilla live are based on Debian
Install Notes: CloneZilla live is booted and run in live mode; no installation is required to use it.
Download Path: Clonezilla Live Stable at SourceForge
Pre Downloaded
ISO
Show All Drives (Use with Care)
Save ISO file
MD5 Check
Type: USB Drive
Drive: D:\
OK
Cancel

d. The boot files will then copy to your USB drive



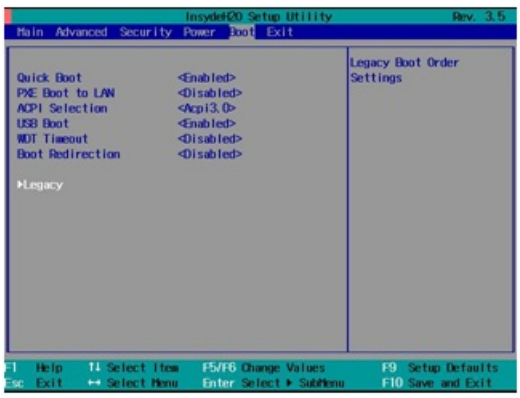
e. Click **Exit** to close the program.


Tuxboot
1. Downloading Files (Done)
2. Extracting and Copying Files (Done)
3. Installing Bootloader (Done)
4. Installation Complete, Reboot (Current)
After rebooting, select the USB boot option in the BIOS boot menu.
Reboot now?
Reboot Now
Exit

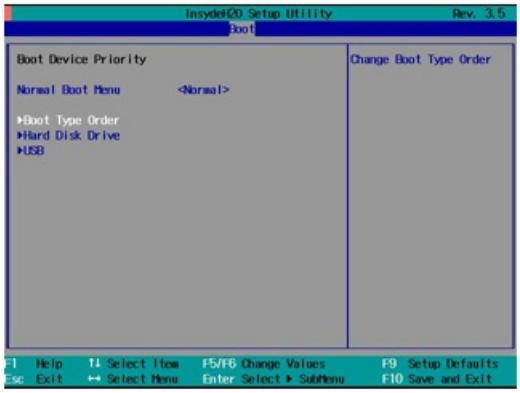
2. Change the BIOS setting to boot from USB disk

To let system boot from USB disk, we need to change the boot priority. Before the following steps, insert your USB disk into the embedded computer.

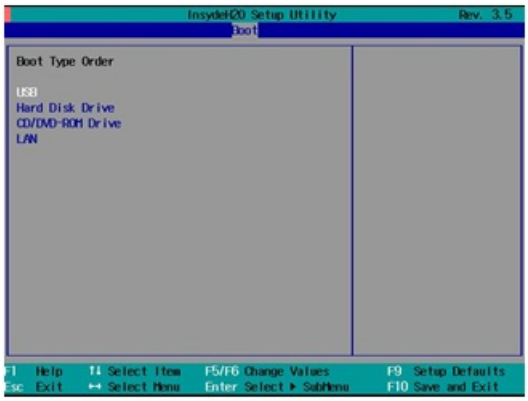
a. Power on and press **F2** to enter bios setup menu.
Select **Legacy** and press Enter.


InsydeH20 Setup Utility Rev. 3.5
Main Advanced Security Power Boot Exit
Quick Boot <Enabled>
PXE Boot to LAN <Disabled>
ACPI Selection <Acpi3.0>
USB Boot <Enabled>
WDT Timeout <Disabled>
Boot Redirection <Disabled>
▶Legacy
Legacy Boot Order Settings
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit

b. Select **Boot Type Order** and press **Enter.**

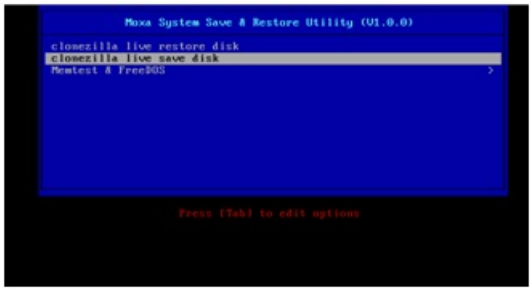

InsydeH2O Setup Utility Rev. 3.5
Boot
Boot Device Priority
Normal Boot Menu <Normal>
▶Boot Type Order
▶Hard Disk Drive
▶USB
Change Boot Type Order
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit

c. Press **+** to select USB as the first boot device type.
Press **F10** and then press **Enter** to save and exit BIOS setup.


InsydeH2O Setup Utility Rev. 3.5
Boot
Boot Type Order
USB
Hard Disk Drive
CD/DVD-ROM Drive
LAN
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ SubMenu F10 Save and Exit

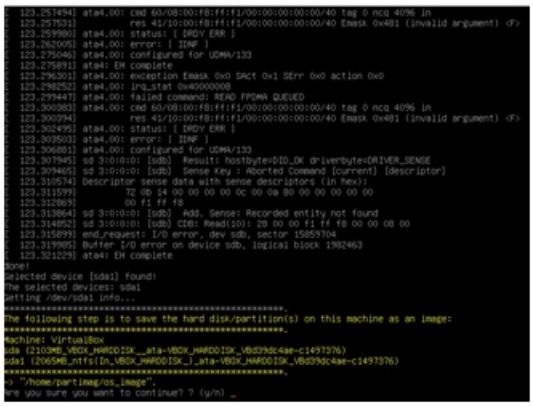
When the system boots up, it will read the recovery files from the USB disk. Follow the steps below:

1. Select **clonezilla live save disk**.

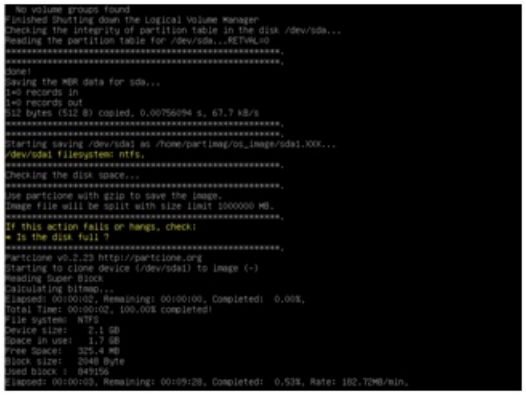

Moxa System Save & Restore Utility (V1.0.0)
clonezilla live restore disk
clonezilla live save disk
Memtest & FreeDOS
Press (Tab) to edit options

2. Wait for USB drive boot process.

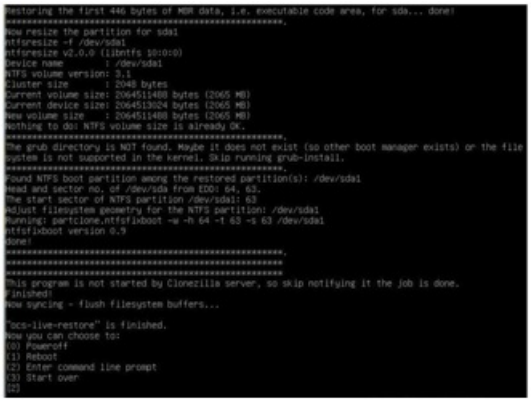
3. Enter **Y** to save the process.



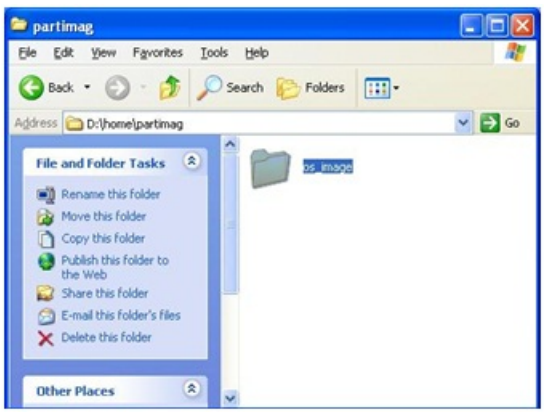
4. Wait for the process to be complete.



5. Select **(0)** to power off the computer after restore process is complete.

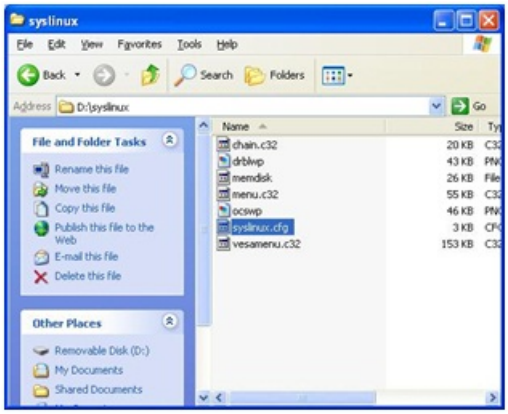


6. The system will save into the **os_image** folder of the USB disk **\home\partimag\.**

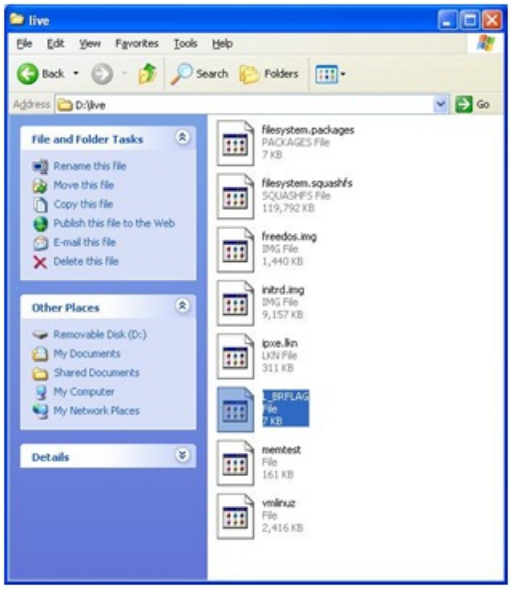


Follow the steps below to modify the USB disk to an auto-execute restore disk:

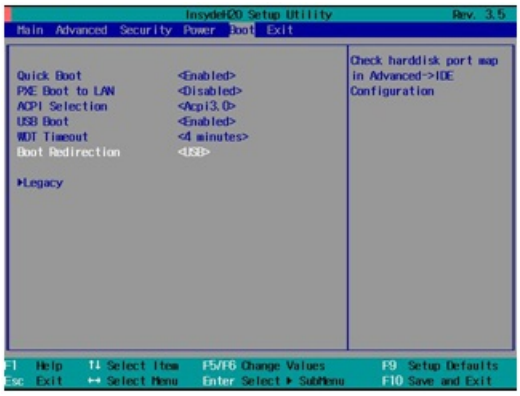
1. Copy **syslinux.cfg** from software CD path: **CD\utility_tools\Smart Recovery** to **USB \syslinux** and overwrite it.



2. Copy **L_BRFLAG** from the software CD path: **CD\utility_tools \Smart Recovery** to **USB \live**



3. When the system has powered on, press **F2** to enter BIOS setup utility, and set WDT timeout to a suitable time length and set Boot Redirection to USB.

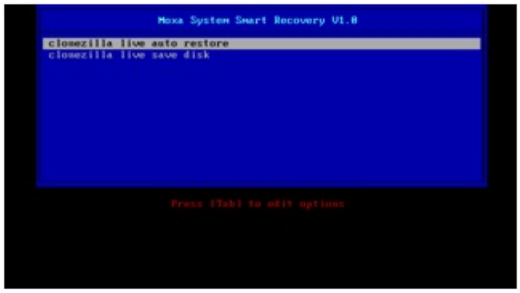


4. Users can normally use their OS and AP to meet the special function.

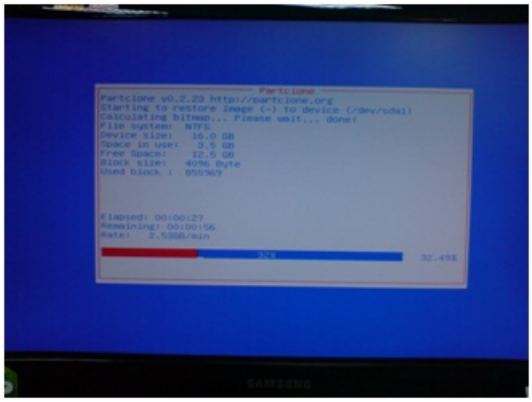
5. If the OS boot-up fails, system will display the blue screen. In this case, the watchdog timer will be counting down.

A problem has been detected and Windows has been shut down to pr
to your computer.
The end-user manually generated the crashdump.
If this is the first time you've seen this Stop error screen,
restart your computer. If this screen appears again, follow
these steps:
Check to make sure any new hardware or software is properly insta
If this is a new installation, ask your hardware or software manu
for any Windows updates you might need.
If problems continue, disable or remove any newly installed hardw
or software. Disable BIOS memory options such as caching or shado
If you need to use Safe Mode to remove or disable components, res
your computer, press F8 to select Advanced Startup Options, and t
select Safe Mode.
Technical information:
*** STOP: 0x000000E2 (0x00000000,0x00000000,0x00000000,0x00000000)

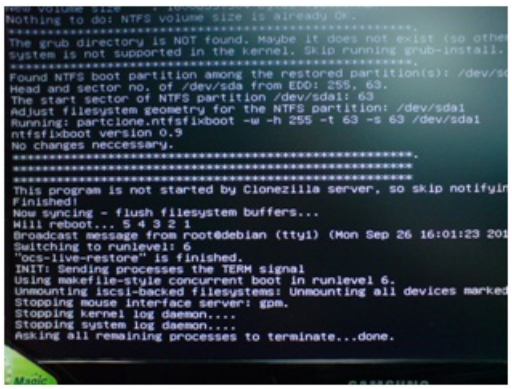
6. When the watchdog timer is up, the system will automatically restart and boot to the USB disk



7. Full automatic setting will save **os_image** folder to the damaged hard disk drive.

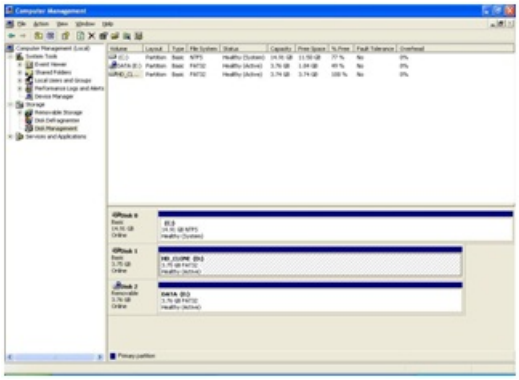


8. When the process is complete, the operating system will automatically restart and operate the normal boot to the hard disk.

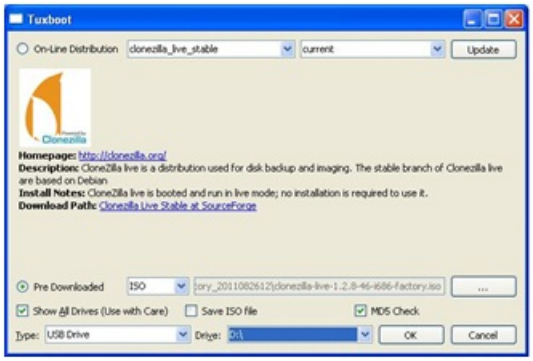

Nothing to do: NTFS volume size is already OK.
The grub directory is NOT found. Maybe it does not exist (so other system is not supported in the kernel. Skip running grub-install.
Found NTFS boot partition among the restored partition(s): /dev/sd
Head and sector no. of /dev/sda from EDD: 255, 63.
The start sector of NTFS partition /dev/sda1: 63
Adjust filesystem geometry for the NTFS partition: /dev/sda1
Running: partclone.ntfsfixboot -w -h 255 -t 63 -s 63 /dev/sda1
ntfsfixboot version 0.9
No changes neccessary.
This program is not started by Clonezilla server, so skip notifyin
Finished!
Now syncing - flush filesystem buffers...
Will reboot... 5 4 3 2 1
Broadcast message from root@debian (tty1) (Mon Sep 26 16:01:23 201
Switching to runlevel: 6
"ocs-live-restore" is finished.
INIT: Sending processes the TERM signal
Using makefile-style concurrent boot in runlevel 6.
Unmounting iscsi-backed filesystems: Unmounting all devices marked
Stopping mouse interface server: gpm.
Stopping kernel log daemon....
Stopping system log daemon....
Asking all remaining processes to terminate...done.

Check the Following Items for Hard Disk Recovery

1. Format the hard disk to FAT32 as disk1.

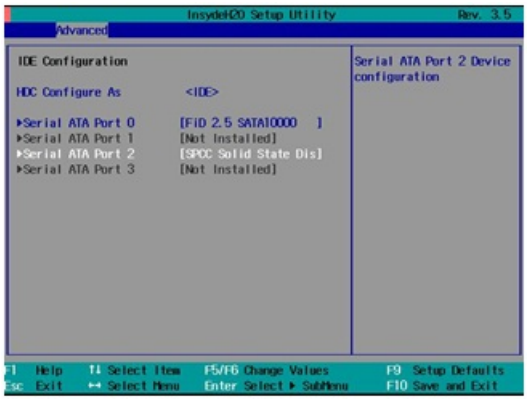


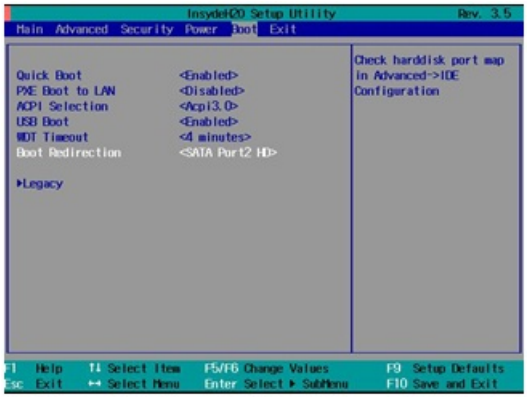
2. In Tuxboot, change the target drive to hard disk.


Tuxboot
On-Line Distribution
clonezilla_live_stable
current
Update
Homepage: http://clonezilla.org/
Description: Clonezilla live is a distribution used for disk backup and imaging. The stable branch of Clonezilla live are based on Debian.
Install Notes: Clonezilla live is booted and run in live mode; no installation is required to use it.
Download Path: Clonezilla Live Stable at SourceForge
Pre Downloaded
ISO
Show All Drives (Use with Care)
Save ISO file
MD5 Check
Type: USB Drive
Drive:
OK
Cancel

3. Build the hard disk recovery image as USB. The boot redirection setting is different.

4. When the system has powered on, press **F2** to enter BIOS setup utility, check the hard disk connection port, set WDT timeout to a suitable time length, and set Boot Redirection to the mapped port. (For example, set system OS disk as Port 0, spare rescue disk as port 2).

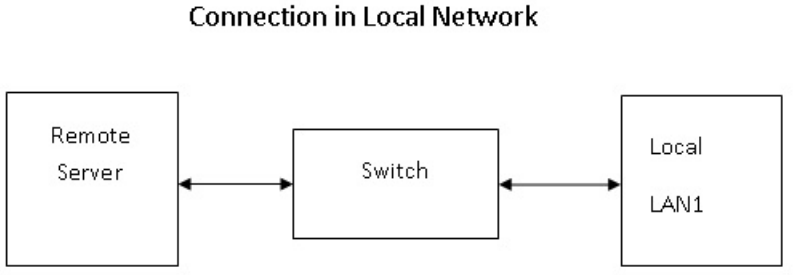

InsydeH2O Setup Utility
Rev. 3.5
Advanced
IDE Configuration
HDC Configure As <IDE>
▸Serial ATA Port 0 [FID 2.5 SATA10000]
▸Serial ATA Port 1 [Not Installed]
▸Serial ATA Port 2 [SPCC Solid State Dis]
▸Serial ATA Port 3 [Not Installed]
Serial ATA Port 2 Device configuration
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit


InsydeH2O Setup Utility
Rev. 3.5
Main Advanced Security Power Boot Exit
Quick Boot <Enabled>
PXE Boot to LAN <Disabled>
ACPI Selection <Acpi3.0>
USB Boot <Enabled>
WDT Timeout <4 minutes>
Boot Redirection <SATA Port2 HD>
▸Legacy
Check harddisk port map in Advanced->IDE Configuration
F1 Help ↑↓ Select Item F5/F6 Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▸ SubMenu F10 Save and Exit

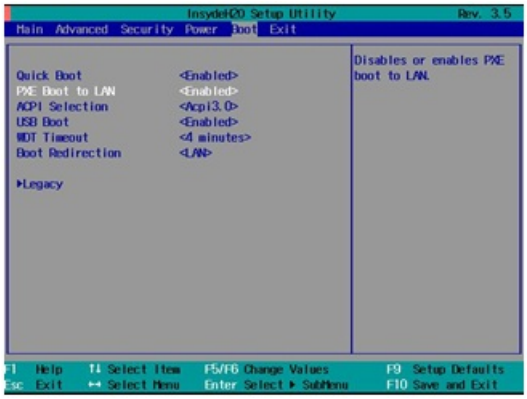
5. When finished, the hard disk will perform in the role of the USB to recover the operating system.

Check the Following Items for LAN Recovery

1. Build the physical network link in remote server and the local device. See the following figure for details.



2. Set PXE Boot to LAN Enabled, WDT Timeout as suitable time length and Boot Redirection to LAN.



3. Refer to the Clonezilla web site about remote server settings: http://clonezilla.org/
4. When all settings have been done, it can work as an USB/SSD.